Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

1g84mw
cop. 3

WASHINGTON, D.C.
AUGUST 1956

Unloading and Receiving Produce in Retail Food Stores

LIBRARY
SEP 26 1956
U. S. DEPARTMENT OF AGRICULTURE

U. S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

MARKETING RESEARCH DIVISION

Marketing Research Report No. 129

ACKNOWLEDGMENTS

The study on which this report is based is part of a larger research project to improve operations of retail produce departments. The work is under the general supervision of R. W. Hoecker, head, Wholesaling and Retailing Section, Transportation and Facilities Branch, Marketing Research Division, Agricultural Marketing Service.

Acknowledgment is made to Food Fair Stores, Inc., and Penn Fruit Co. of Philadelphia, Pa., for their assistance and cooperation in conducting the tests reported in this publication.

CONTENTS

	Page
Summary	1
Introduction	1
Unloading produce order on parking lot	2
Unloading produce in night receiving room	4
Produce receiving operation	6
Unloading and receiving as a single operation	7
Unloading and receiving watermelons	9
Conclusions and recommendations	11
Appendix	12

For sale by the Superintendent of Documents, U. S. Government Printing Office
Washington 25, D. C. - Price 10 cents

UNLOADING AND RECEIVING PRODUCE IN RETAIL FOOD STORES

By
Paul Shaffer and Dale Anderson
agricultural marketing specialists,
Transportation and Facilities Branch,
Marketing Research Division,
Agricultural Marketing Service

SUMMARY

Produce is most efficiently unloaded and received by being placed on pallets in the warehouse and left on the same pallets until it is used in the store. In this study, 163 cases per man-hour were handled by this method. A loading dock at the store is necessary in order to take full advantage of pallet handling.

Where the stores did not have loading docks, the most efficient unloading and receiving was by use of semilive skids, with an average capacity of 20 cases, to haul in the load. Production, including unloading time, was 81 cases per man-hour.

In some stores, the produce was unloaded into night receiving rooms. The most efficient operation of this type employed a 2-man crew and conveyor equipment. Including the time required to store those cases not used during the morning setup, the standard for this operation was 76 cases per man-hour.

An inexpensive collapsible rack, used in conjunction with semilive skids for the unloading and receiving of watermelons, will save about 50 percent of labor costs. This rack, with an approximate capacity of 50 melons, also has many uses in the produce department, such as for the display of watermelons, bagged potatoes, onions, etc., for storing merchandise in the back room, and as a receptacle for wood or cardboard trash.

Studies were made in 15 supermarkets of 3 retail food chains to determine methods and costs of their present unloading and receiving operation. The unloading and receiving function included all operations involved in moving produce from the truck trailer to final storage in the store. It is the first handling operation that occurs at the retail level and the cost of performing it is less than 5 percent of the total produce handling costs in the retail store. As a result of the studies, a number of improvements were installed in the store, employees were trained in their use, and time studies taken to evaluate the improvements.

INTRODUCTION

The produce department is the third largest department in most supermarkets, ranking in volume of sales after the grocery and meat departments. In most supermarkets produce accounts for 10 to 12 percent of the store's sales volume and because of its perishability, the margin to handle it is one of the highest in the store. The unloading and receiving of produce is the first handling operation performed at the retail level. The cost of this function is less than 5 percent of the total cost of handling produce in the retail store.

Methods of unloading and receiving produce at retail food stores range from carrying the produce into the store by hand to a completely palletized operation where individual cases are not handled. Since no 2 stores are exactly alike and all firms and managers have their own views as to the methods to use, there is little standardization of procedures.

Studies were made in 15 supermarkets of 3 retail food chains to determine methods and productivity of their present unloading and receiving operation. The unloading and receiving function included all operations involved in moving produce from the truck trailer to final storage in the store. A number of improvements were made as a result of the studies. These improved practices were adopted in several stores and employees trained in their use. Time studies were then made to evaluate improvements.

It is recognized that part of the produce receiving operation is the preparation of the back room; aisles must be cleared and space must be provided for the storage of merchandise. However, it was virtually impossible to define the extent to which this preparation should be charged to receiving and which to normal housekeeping. Since the amount of preparation varies from store to store, depending on store layout, the time required to perform this function was excluded from all standards.

In order to compare the various methods, all studies were based on 100 cases per order, a number approximating the average daily receipts for the stores studied. Since the distance from unloading area to the back room storage area varies from store to store, the time standards were adjusted to reflect an equal distance in each method. Variation due to speed of operator was removed by applying a rating factor to the average time for each element studied in order to convert actual performance to expected performance by the average operator using the same method.

Unloading consisted of the steps involved in moving produce from the trailer to its first storage point, whether that be on the lot beside the trailer, in the night receiving room, or in the cooler. In order to have the produce order available for display when the store opens, many firms make deliveries during the early morning hours. The order is either stacked on the lot outside the produce receiving door or in the store in a night receiving room which can be locked off from the rest of the store.

UNLOADING PRODUCE ORDER ON PARKING LOT

Typically, the produce is unloaded outside the store only when there is no receiving dock or unloading pit. Under these circumstances, the produce is unloaded on the lot by delivery personnel and later transported into the store by produce clerks. Time studies were made of the unloading operation using both 1- and 2-man crews with and without conveyors.

When only one man unloaded the order he carried the cases to either the rear or side trailer door and placed them on the floor so he could reach them from the ground. As soon as the doorway was full he descended to the ground and removed the cases from the doorway, placing them in stacks on the ground (fig. 1). Occasionally, he would move the trailer forward to minimize the distance from trailer to stack. This unloading operation necessitated handling each case twice, except those few which could be placed directly on top of cases stacked on the ground and those cases which were originally located in either doorway when loaded. One man unloaded the average size order of 100 cases at the rate of 162 cases per man-hour, or 0.370 man-minute per piece (table 1).

Table 1.--Comparative time and labor productivity for unloading produce on the lot by 1- and 2-man crews, with and without travel time of 2nd man[1]

Item	Unit	1-man crew	2-man crew
Standard time per case to unload	Man-min.	0.370	0.465
Travel time per case	do.	0	.205
Total time per case	do.	0.370	0.670
Production per man-hour	Cases	162	90

[1] Travel time of 2nd man included since his only function is to help unload.

When a second man was assigned to the produce delivery truck, one man moved the case to the trailer door and the other man placed it on the ground. This operation was characterized by numerous delays and 24 percent of the unloading time was idle time. The man on the ground was idle while the man in the trailer walked to and from the merchandise stacks in the trailer or when he placed a case directly on top of a stack on the ground. When travel time of the man who helped unload produce on the lot was excluded, production for the 2-man crew was 129 cases per man-hour, or 0.465 man-minute per case.

Neg. BN-2474

Figure 1.--Placing produce cases in stacks on the parking lot.

The 1-man crew was 26 percent more productive per man-hour than the 2-man crew in the unloading operation. When travel time of the helper is added to unloading time, productivity of the 2-man crew is 90 cases per man-hour or 56 percent of that of the 1-man crew.[1]

Although the 1-man crew was more productive in the unloading operation, especially when travel time of the helper is included, the following factors favor the 2-man crew for the combined delivery and unloading operations: (1) Decreased equipment tie-up time; (2) reduced fatigue for unloader when pieces are handled only once rather than twice by each employee; and (3) increased possibilities of making deliveries to more stores before opening time. Because of the important relationship of the truck driver's helper to the delivery function the travel time of the helper is excluded from all subsequent analyses of the unloading and receiving operations.

Studies were made of trailers equipped with conveyors (usually two 10-foot sections, stand and stop) to determine their effect on unloading productivity of a 1-man and a 2-man crew. In both instances one section was set up at the door of the trailer and extended 10 feet out into the lot. The second section was added to the first as the trailer was unloaded.

In the 1-man operation, the operator placed cases on the conveyor until it was loaded and then descended to the ground and placed the cases in stacks along each side of the conveyor.

---

[1] Travel time averaged 18 minutes per store order and was the time required to drive the truck from warehouse to store or from one store to the next. As travel time per order increases, the nonproductive time of the helper becomes proportionally higher.

When a 2-man crew was used, one man placed the cases on the conveyor and the second man placed them in stacks on the ground (fig. 2). Production was 138 cases per man-hour for the 1-man operation and 130 cases per man-hour for the 2-man operation (table 2).

Table 2.--Comparative productivity in unloading produce on the lot at retail food stores for alternative methods for 1- and 2-man crews

Operation	Standard time per case	Cases per man-hour
One-Man		
Place on ground	*Man-minutes*	*Number*
Unload by hand	0.370	162
Unload with conveyor	.434	138
Place on skids		
Unload by hand	.413	145
Unload with conveyor	.479	125
Two-Man		
Place on ground		
Unload by hand	.465	129
Unload with conveyor	.460	130
Place on skids		
Unload by hand	.508	118
Unload with conveyor	.504	119

To facilitate the movement of the produce into the store 30- by 60-inch semilive skids were tested in several stores (fig. 3). As many skids as were available were stacked on end in the unloading area ready for the truck delivery personnel. Instead of placing the cases on the ground they were stacked, when possible, by respective commodity grouping on the skids. When skids were used, the additional time required to obtain empty skids and pick up and move aside full skids was added to the unloading standards. Although as shown in table 2, production for the unloading operation decreased with the use of skids, this decrease was more than compensated by subsequent savings in the receiving operation.

UNLOADING PRODUCE IN NIGHT RECEIVING ROOM

In order not to subject produce to temperature extremes on the lot and as a security measure, some stores unload into a night receiving room (lobby), which normally is locked off from the rest of the store. Since there were no loading docks in the stores in which studies were made, either some form of conveyor equipment was used or the cases were carried into the lobby.

One organization in which studies were made used only one man on the delivery trucks for those days when the produce orders were small and 2 men when they were large. An operator working alone first placed as many cases as possible in the trailer doorway. He then carried them into the lobby. Production for this operation was 69 cases per man-hour.

When a second man was added a 10-foot section of conveyor was carried in the trailer. This conveyor extended from the trailer doorway into the produce receiving door. This was a conventional "pitch and catch" operation, with one man in the trailer placing the cases on the conveyor and the other man removing and placing them in stacks in the lobby. Production per man-hour was 66 cases.

Improvements were made in the operation of unloading in the night receiving room which involved more extensive use of conveyor equipment and eliminated most of the walking and carrying of cases. When one man unloaded the order, conveyors extended from inside the trailer to the lobby storage area with a case stop on the end and with regular

Neg. BN-2475

Figure 2.--A 2-man team unloading the produce order with conveyors.

Neg. BN-2476

Figure 3.--Using semilive skids to pull in the produce order.

conveyor stands supporting the conveyor. After the operator loaded the conveyor he descended to the ground and removed the cases from the conveyor, placing them in stacks in the lobby. He unloaded the produce at the rate of 91 cases per man-hour, as compared to 69 cases in the unimproved operation--an increase in production of 32 percent.

A second man was added to eliminate climbing in and out of the trailer and to speed up the unloading. By extending the conveyor into the trailer (as the trailer was unloaded) and to the point of storage, most of the carrying was eliminated (fig. 4). The improved conveyor installation increased production by 48 percent, from 66 to 98 cases per man-hour. Hence, of the 4 methods of unloading in night delivery room, this is the most productive.

Neg. BN-2477

Figure 4.--The use of a 4-wheel stocking truck to receive produce.

PRODUCE RECEIVING OPERATION

The receiving operation consisted of moving produce from the point where it was unloaded upon delivery to the final storage point. When the order was unloaded on the lot, all the merchandise had to be moved into the store. When the produce was delivered to a night receiving room, the receiving operation consisted of moving to storage those items which were not immediately processed. Also included in the standard time for the receiving function was time to check-in the order and to place the date on the face of the case or container.[2] In the stores where produce was unloaded in the lobby or night receiving room, only those cases which were moved to final storage were dated.

Time studies were made for receiving with handtrucks and semilive skids with 1- and 2-man crews. One of the most important factors in determining the time standards for the receiving operation was the extent to which the cases were hand stacked at the point of final storage. The more the cases are handled, the higher the labor costs.

Studies were made of operations using 2- and 4-wheel handtrucks. When it was possible to load a stack of cases without manual handling, the 2-wheel handtruck was used, otherwise, the cases were loaded on the 4-wheel (platform type) truck (fig. 4). The average load carried on the 4-wheel truck was 4.7 cases. All the merchandise was hand stacked in the proper commodity location. Production for the receiving operation with 4-wheel handtrucks averaged 87 cases per man-hour or 0.692 man-minute per case (table 5) in the operations studied. There was no significant difference in productivity per man-hour when a second man helped bring in the load.

When semilive skids were used for receiving produce, the extent to which the store personnel removed the produce from the skids in the backroom varied from store to store. In some stores the skids were completely unloaded, in others only cooler merchandise was unloaded, and finally, in some stores the full skids were parked in the proper storage location without unloading any of the produce at that time. To avoid excess digging for merchandise in ensuing operations when full skids were parked, it was necessary that they be properly loaded by: (1) Separating the cases by merchandise categories; (2) avoiding mixing cooler and noncooler merchandise on the same skid; and (3) placing heavy items on bottom and light items on top of the load.

Time studies for the receiving operation with semilive skids when all the skids were parked in the store room indicated a production of 200 cases per man-hour for a 1-man crew and 181 cases per man-hour for a 2-man crew. However, because of the weight of the loaded skids, possible obstacles, such as door sills or elevations between the lot and storage, and the safety factor, a 1-man crew is not recommended. The average capacity of the semilive skid was 20 cases.

In stores in which all merchandise was hand stacked in the final storage area, production was 91 cases per man-hour for a 2-man crew. Productivity was 130 cases per man-hour, an increase of 43 percent, when only the merchandise requiring refrigeration was hand stacked and the rest was parked on skids. When the merchandise was all stored on skids parked in the storage area, production was 181 cases per man-hour, 0.332 man-minute per case (table 5), or twice that of hand stacking all merchandise, and 39 percent over hand stacking cooler merchandise and storing the rest on parked skids.

In order to determine whether hand stacking or parking the merchandise on skids had any effect on the time to perform the next operation (obtaining case from storage), studies were made of 2 operations, one which hand stacked all items in storage and one which parked the skids on which merchandise had been properly stacked. There was no significant difference in the time required between the 2 methods to "obtain from storage."

---

[2] A porous-tip self-inking, adjustable hand stamp, not available when the studies were made, was tested for the dating of produce. This stamp reduced the time requirements for dating (with crayon) by 32 minutes per 1,000 cases, or 72 percent.

When the produce was parked on skids in the night receiving room, the receiving operation consisted of checking the order and dating and moving to storage those cases which were not processed during the morning setup. In the hand stacking method of receiving, the cases remained on the floor in the lobby until used. If not used in the morning setup, they were then moved to storage. The productivity was 305 cases per man-hour or 0.197 man-minute per case. In the improved operation, some commodities which normally were not placed under refrigeration, such as potatoes, onions, and citrus, were given a permanent storage location in the lobby and placed in that location by delivery personnel. Hence, fewer pieces were moved to final storage. Production was 345 cases per man-hour or 0.174 man-minute per case (table 5). Although this method reduces the physical handling of the produce, it should be pointed out that many of the items which require refrigeration were stored unrefrigerated in the lobby from the time they were received until several hours later when they were processed or placed in the cooler.

UNLOADING AND RECEIVING AS A SINGLE OPERATION

In order to eliminate extra handlings, some firms move the produce directly from the trailer to the point of final storage. If the store doesn't have a loading dock or pit, this operation can be performed by conveyor equipment. If the store has a loading dock or pit, the merchandise can be handled on pallets, or on 2- or 4-wheel handtrucks; or skids can be loaded in the trailer and wheeled to the storage area.

Delivery personnel used conveyors and 4-wheel dollies to move produce to storage in one type operation studied. Since produce is normally stored in different parts of the backroom and since the store was not designed for this type of unloading operation, it was difficult to install conveyors to reach each storage point. Therefore, those cases which went to the cooler were removed from the conveyor and placed on 4-wheel dollies, which were then rolled into the cooler and parked. Other items such as potatoes, onions, bananas, and citrus which did not go into the cooler were placed in the backroom in segregated stacks (in this instance, their permanent storage location). The backroom was so designed that both the cooler and other produce storage areas could be locked off.

In unloading produce in its permanent storage areas using conveyors and a 2-man delivery crew, the normal procedure was for one man to work on the truck while the other worked in the store. Since the man in the store had a greater workload, the resultant delay (amounting to 26 percent of the total time) limited the productivity of the method to 64 cases per man-hour or 0.936 man-minute per case (table 3). However, this method of unloading eliminated the receiving operation for store personnel.

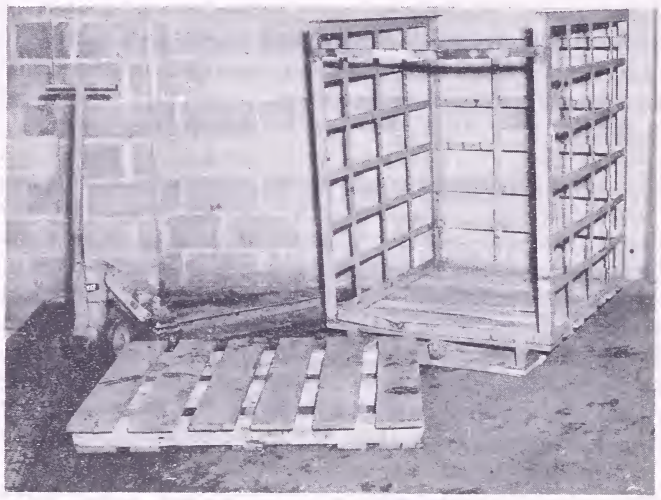
Table 3.--Comparative productivity of alternative methods of unloading produce and storing it directly in its permanent storage area

Method	Standard time per case	Cases per man-hour
	Man-minutes	*Cases*
Unload to final storage area with conveyor (2-man)	0.936	64
Unload with 2- and 4-wheel handtrucks (unloading dock) (1-man)	.644	93
Unload pallets and hand stack (loading dock) (1-man)	.605	99
Unload pallets and park in storeroom (loading dock) (1-man)	.369	163

Two- and four-wheel handtrucks were used in another type of operation, where a loading dock was available to transport the produce from trailer to point of final storage.

Whenever it was possible to pick up a stack of several cases at a time, a 2-wheel truck was used, thus eliminating the manual handling of the cases. In some instances, the loads were left stacked as hauled in, but otherwise, the cases were hand stacked with all merchandise placed in appropriate commodity stacks. Essentially, this unloading operation was the same as receiving with 2- and 4-wheel handtrucks, the major difference being that instead of loading the handtruck with cases that had been stacked on the ground, the handtrucks were wheeled into the trailers and loaded. Production for this type of unloading operation was 93 cases per man-hour or 0.644 man-minute per case (table 3).

The most productive method studied was handling the produce order completely with pallets (figs. 5 and 6). The stores using this method had loading docks and were supplied with pallet jacks. The trailer was parked at the loading dock and unloaded by store personnel. When there were two or more store orders on a trailer, delivery personnel unloaded the trailer. When the order was especially large, lighter merchandise was stacked on top of the loaded pallets. The loaded pallets were moved to the storage area



BN-2478

Figure 5.--Pallet jack and two types of pallets used.

BN-2473

Figure 6.--A loaded pallet being pulled out of trailer with pallet jack.

where approximately 68 percent of the cases were unloaded and placed in stacks. The rest of the cases were left on the pallets and parked in the storeroom. Production for this operation was 99 cases per man-hour or 0.605 man-minute per case (table 3). When all the loaded pallets were parked in their final storage area, rather than unloaded by hand when received, the production was increased to 163 cases per man-hour or 0.369 man-minute per case (table 3).

Of the several methods of unloading where the unloading and receiving functions were combined, the palletized operation was the most productive (table 3). This was the result of the reduced amount of case handling and increasing the size of the load.

UNLOADING AND RECEIVING WATERMELONS

None of the preceding standards include the handling of watermelons; a separate study was made of watermelon handling in retail stores. In this study the average delivery included about 50 melons weighing between 20 and 30 pounds each. The melons were unloaded outside the produce receiving door by the delivery personnel and were stacked on the ground except when a collapsible rack was used. Four different methods and types of equipment for handling melons were evaluated.

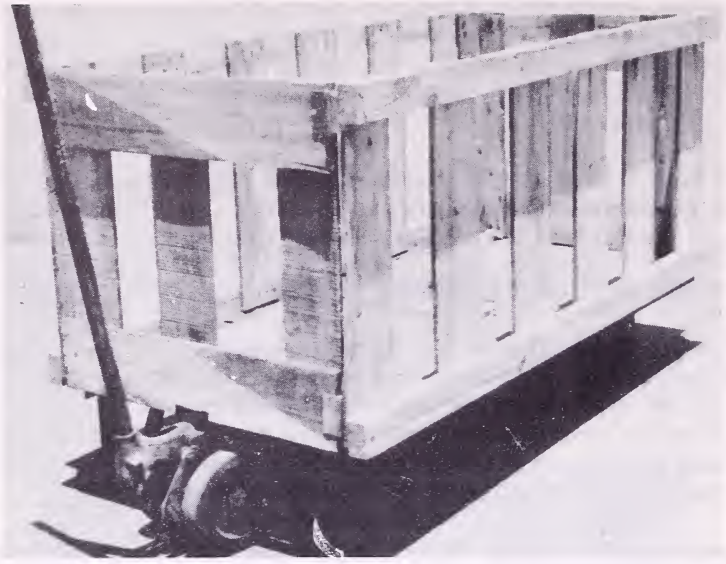
In one commonly used method, "baskarts" with a capacity of 7 melons were used to haul the melons either to display or to the backroom storage area. In another typical handling method, lettuce or carrot crates were loaded on a platform-type stocking truck and filled with melons. Two crates on the truck held, on the average, 13 melons. Some stores used 30- by 60-inch semilive skids for produce receiving and storage. Three crates placed on this type of skid held approximately 21 melons. In each of these 3 methods, the carrier was used only to transport the melons to display or storage. Of these 3 methods, the use of the semilive skid with crates was the most productive (table 4).

Table 4.--Comparative efficiency of 4 methods of unloading and receiving watermelons

Method	Melons handled per man-hour	Man-hours per 1,000 melons
	Number	*Number*
Baskart	105	9.6
Stocking truck	104	9.6
Semilive skid with crates	133	7.5
Semilive skid with collapsible rack	220	4.5

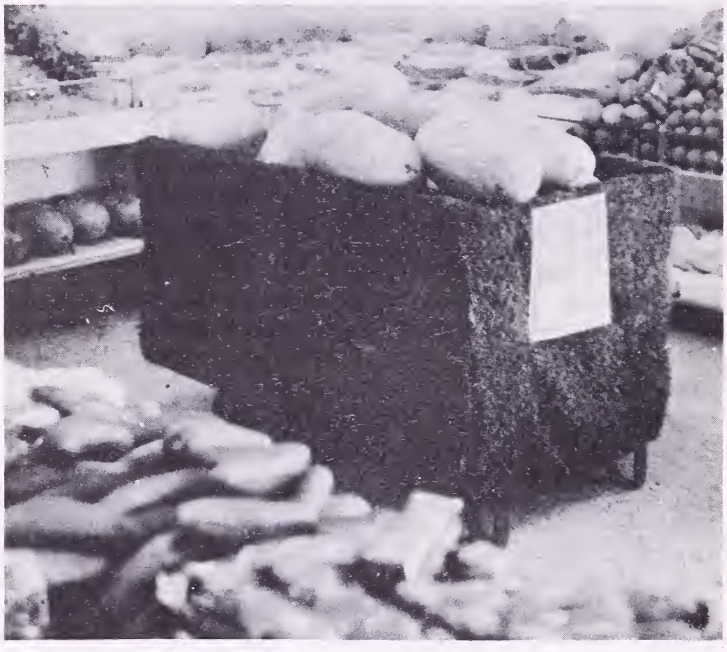
To reduce the number of handlings and to increase the number of melons hauled per trip, a collapsible rack was designed which would fit on the semilive skids and which could also be used for displaying the watermelons (fig. 7). This rack has an approximate capacity of 50 melons. When used for display, grass mats were draped over each side (fig. 8). Since the rack is collapsible, it requires little space for storage. It also can be used for bulk displays or for displaying potatoes and onions.[3] By this method, melons were handled at the rate of 220 per man-hour compared with 133 by the next most efficient method.

[3] When built in lots of 50 to 100, the cost is about $7 per rack. For construction details, see Appendix, figure 9.



BN-2481

Figure 7. --Collapsible rack used for handling and displaying watermelons.



BN-2479

Figure 8. --Watermelon rack used for display with grass mats draped over each side.

One firm studied uses a combination pallet and rack. This reduces handling to a minimum--the melons are not handled from the time they are loaded in the racks at the warehouse until they are displayed. However, the stores must have truck-bed height loading docks and a pallet jack in order to use the pallet rack.

CONCLUSIONS AND RECOMMENDATIONS

In order to evaluate the alternative methods of produce unloading and receiving, it is necessary to combine the two functions, since they are closely related and in some instances overlap. Basically, there were 4 distinct types of methods: (1) Unloading on the lot and receiving with 2- and 4-wheel handtrucks; (2) unloading onto semilive skids, moving the loaded skids to the backroom and storing on skids; (3) unloading to a night receiving room and later moving merchandise to shelves or final storage; and (4) combining the operations by unloading and moving the merchandise directly to final storage.

The most efficient method was of the 4th type by which the produce is delivered on pallets, unloaded on pallets, and parked or stored in the backroom or cooler on pallets, using only one man. The relatively high production rate of 163 cases per man-hour by the method can readily be explained by the absence of individual handling of cases of merchandise and the large size of the unit load (table 5).[4] In order to take advantage of this method the store must have a loading dock. To obtain low labor costs for the operation, it is essential that the produce be unitized, either on pallets or skids. To avoid considerable digging and searching for individual cases in the ensuing operations, it is important that the produce be placed on the skids or pallets by proper merchandise categories--the more the produce is segregated, the larger the loads possible.

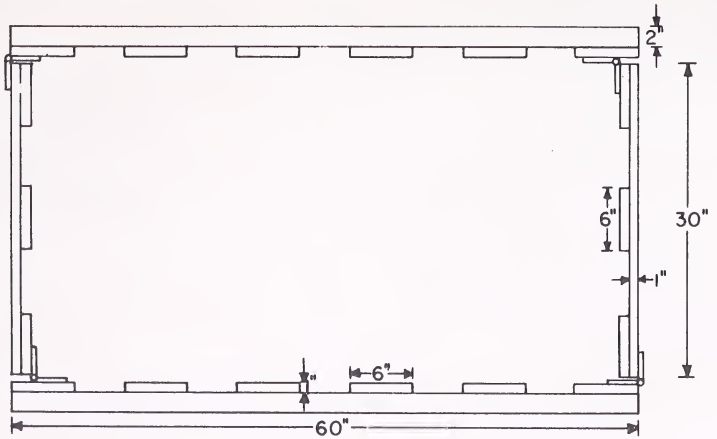
Table 5.--Comparative productivity of several methods of unloading and receiving produce in retail food stores

Method	Standard time per case			Cases per man-hour
	Unloading	Receiving	Unloading and receiving	
	Man-minutes	*Man-minutes*	*Man-minutes*	*Cases*
Unload on ground by hand (1-man).....	0.370			
Receive with handtrucks (1-man).....		0.692	1.062	56
Unload on skids by hand (1-man).....	.413			
Receive with skids (2-man).....		.332	.745	81
Unload in lobby with conveyor (2-man)..	.611			
Put away remaining cases.....		.174	.785	76
Combined operation				
Unload and place in storage with conveyor (2-man).....	--	--	.936	64
2- and 4-wheel handtrucks (1- or 2-man crew); loading dock available.....	--	--	.644	93
Produce shipped and unloaded on pallets (1-man) (68 percent hand stacked); loading dock.....	--	--	.605	99
Produce shipped and unloaded on pallets (1-man) (all parked on pallets); loading dock.....	--	--	.369	163

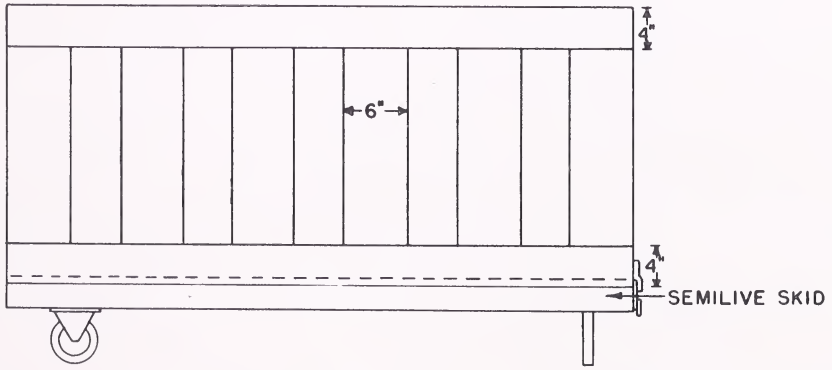
[4] For detailed breakdown of the various methods of unloading and receiving see Appendix, table 6.

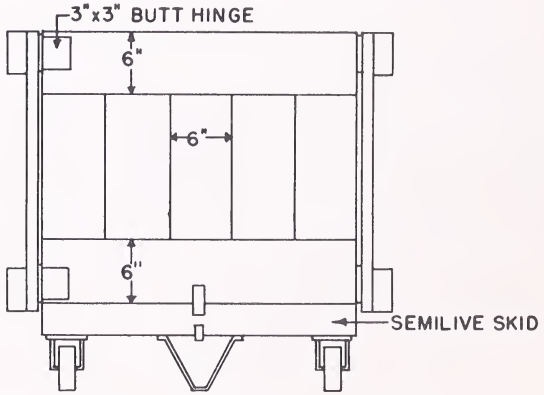
Table 6.--Time requirements per case for 7 methods of unloading and receiving produce

Operation	Unload on lot outside store		Night receiving room	Combined receiving and unloading operation			
	Unload on ground, receive on handtrucks	Unload on skids, receive & store on skids	Unload with conveyor, put away after morning setup	Conveyor installation	Loading dock; handtrucks	Loading dock; pallets with 68 percent of cases hand stacked	Loading dock; unloaded and parked on pallets
Unloading	*Man-min.*	*Man-min.*	*Man-min.*	*Man-min.*	*Man-min.*	*Man-min.*	*Man-min.*
Prepare to unload	0.025	0.023	0.037	0.037	0.039	0.016	0.016
Conveyor handling	--	--	.045	.058	--	--	--
Skid and jack handling	--	.038	--	.006	--	--	--
Order checking	.031	.031	.033	.033	.031	--	--
Case handling	.233	.238	.253	.320	.152	--	--
In and out of trailer	.020	.018	.010	.011	--	--	--
Delay	--	--	.122	.211	.017	--	--
Travel	--	--	--	--	--	--	--
Miscellaneous	.013	.011	.031	.031	.022	--	--
Total	0.322	0.359	0.531	0.707	0.261	0.016	0.016
Receiving							
Prepare to receive	.032	.023	--	--	--	.026	.046
Skid & jack handling	--	.020	--	--	--	.077	.046
Travel	.181	.135	--	.040	.158	.088	.098
Case handling	.267	.012	.116	--	.118	.203	--
Check order	.023	.045	.023	.023	--	.045	.047
Date merchandise	.043	.043	.012	.043	--	.043	.043
Miscellaneous	.036	.009	--	--	--	.020	.025
Delay	--	.002	--	--	--	.008	--
Handtruck handling	.020	--	--	--	.023	--	--
Total	0.602	0.289	0.151	0.106	0.299	0.510	0.305
Total time per case	.924	.648	.682	.813	.560	.526	.321
Personal and fatigue allowance 15 percent	.139	.097	.102	.122	.084	.079	.048
Combined standard time for unloading and receiving	1.063	0.745	0.784	0.935	0.644	0.605	0.369
Standard in cases per man-hour	56	81	76	64	93	99	.163



NOTE—HINGES MUST BE PLACED AS SHOWN IN ORDER FOR RACK TO BE COLLAPSIBLE





WATERMELON RACK

U.S. DEPARTMENT OF AGRICULTURE

NEG 3322-56(5) AGRICULTURAL MARKETING SERVICE

Figure 9. --Construction details for watermelon rack.

* U.S. GOVERNMENT PRINTING OFFICE : 1956 O - 390465